


**PS-701**

## Description

The PS-701 SO (Saw Oscillator) from Vectron is a high frequency, ultra low phase noise oscillator designed to support high speed data converters and 100G / 400G coherent optical receivers. The PS-701 provides 9fs rms jitter in a 12kHz to 20MHz integration bandwidth and is available from 0.6 to 3.0GHz. Due to its robust construction it can withstand shock up to 20.000g

## Features

- Frequency Range 0.6 to 3.0 GHz
- Ultra low jitter performance
- Typical Jitter: 9fsec rms, 12kHz to 20MHz
- 3.3 + 5V supply voltage
- Output: Sinewave & LVPECL
- 5x7 mm SMD package
- 20.000G shock survival
- See table on Page 5 for standard frequencies

## Applications

- Military
- Test & Measurement
- Industrial
- Communication

## Performance Specifications

Frequency Stabilities					
Parameter	Min	Typ	Max	Units	Notes
Over All Tolerance			±250	ppm	Includes df vs: •Initial •Operating temperature range +10 .. 85°C •Aging 10 years •Supply Voltage Change 5% •Load change 10%
Supply Voltage (Vs)					
Supply voltage (standard)	4.75	5.00	5.25	V DC	
Current consumption			50	mA	@ sinewave
Supply voltage (standard)	3.135	3.3	3.465	V DC	
Current consumption			75 95	mA mA	@ sinewave @ LVPECL

## Performance Specifications (Continued)

RF Output					
Parameter	Min	Typ	Max	Units	Notes
Signal	Sinewave				Package G352
Load	45	50	55	$\Omega$	
Output Power	4	7	10	dBm	
Signal	LVPECL				Package G356
Load	45	50	55	$\Omega$	
Duty Cycle	45		55	%	
Phase Noise: 100Hz offset		-83		dBc/Hz	@ 1GHz Sinewave 3.3V
Phase Noise: 1kHz offset		-113		dBc/Hz	
Phase Noise: 10kHz offset		-140		dBc/Hz	
Phase Noise: 100kHz offset		-152		dBc/Hz	
Phase Noise: 1MHz offset		-155		dBc/Hz	
Phase Noise: 10MHz offset		-165		dBc/Hz	
Phase Noise: 40MHz offset		-167		dBc/Hz	
Jitter: 12kHz to 20MHz offset		9		fs rms	

Additional Parameters					
Parameter	Min		Max	Units	Notes
Weight	1.0g				
Subharmonics			-20	dBc	> 1.2 GHz
Processing and Packing	Handling and Processing Note				

Absolute Maximum Ratings					
Parameter	Min		Max	Units	Notes
Supply Voltage ( $V_s$ )			6.0	V	
Operable Temperature Range	-40		+85	$^{\circ}\text{C}$	
Storage Temperature Range	-40		+95	$^{\circ}\text{C}$	

Environmental Conditions	
Rapid Temperature Changes	MIL-883-1010 Cond B 500 cycles -55/125C
Vibration	MIL-STD-883 Meth 2007 Cond A: 20g 20-2000Hz 4x in each 3axis 4 min sweep time
Shock	MIL-STD-883G Meth 2002.4 Cond. D: 5000g 0,3ms 6 shocks in each direction MIL-STD-883G Meth 2002.4 Cond. E: 20000g 0,2ms 1 shock
Solderability	J-STD-002C Cond A, leaded Cond. B SMD (MIL-STD-883 M 2003); 245 $^{\circ}\text{C}$ Dip&Look with 8h damp pre-treatment
Solvent Resistance	MIL-STD-883 Meth 2015 Solv. 1,3,4
ESD	JESD22-A114F Class 1; 10* 800V
Moisture Sensitivity	Level 1 JESD22-A113-B
RoHS Compliance	100% ROHS Compliant

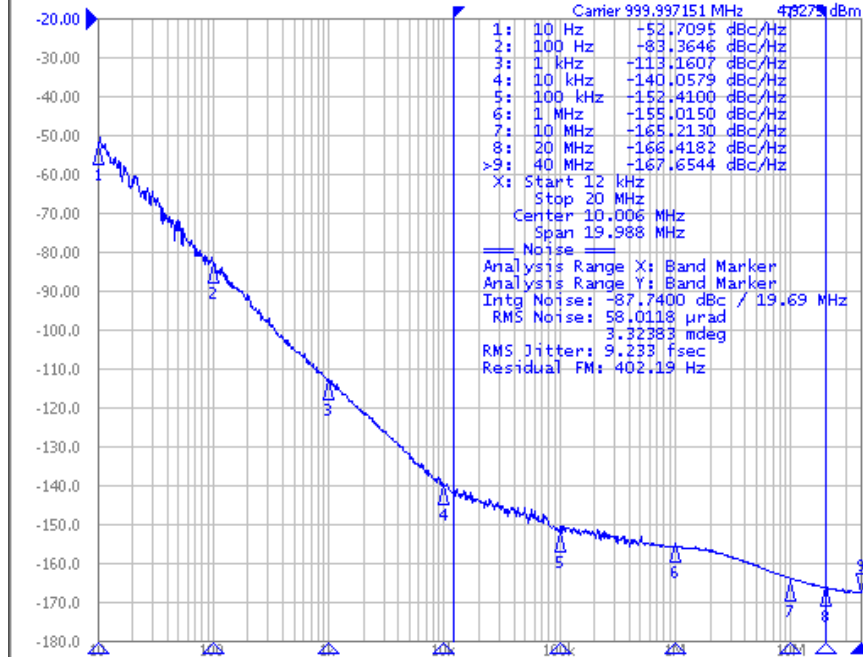
# Typical Performance

## Phase Noise

PS-701 @ 1GHz Sinewave

Agilent E5052A Signal Source Analyzer

Phase Noise 10.00dB/ Ref -20.00dBc/Hz



IF Gain 50dB Freq Band [300M-7GHz] Omit LO Opt [<150kHz] 853pts

Phase Noise Start 10 Hz Stop 40 MHz 11/16

Phase Noise: Meas Cor Ctrl 1.65V Pow 3.3V Attn 0dB ExtRef Stop Svc 2017-05-09 10:12

Average

Averaging

Restart

Avg Factor

16

Averaging

ON

Correlation

1

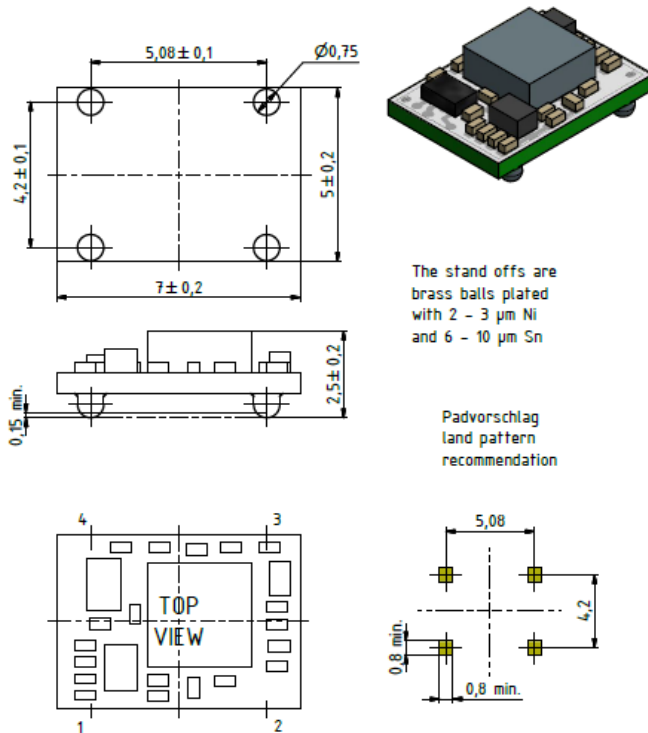
Return

## Outline Drawing / Enclosure

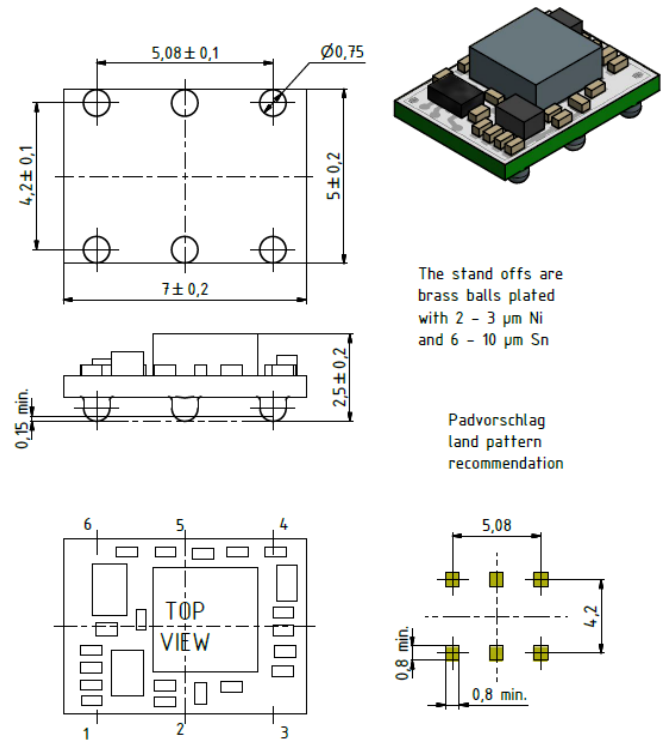
Package Codes		
Code	Height "H"	Pin Length "L"
G352	2.5	N/A
G356	2.5	N/A

Dimensions in mm

### G352



### G356



#### Pin Assignment Sinewave (G352)

1	N.C.
2	GND
3	RF-Out
4	Supply Voltage Input ( $V_s$ )

#### Pin Assignment LVPECL (G356)

1	N.C.
2	Enable
3	GND
4	RF-Out
5	RF-Out_complementary
6	Supply Voltage Input ( $V_s$ )

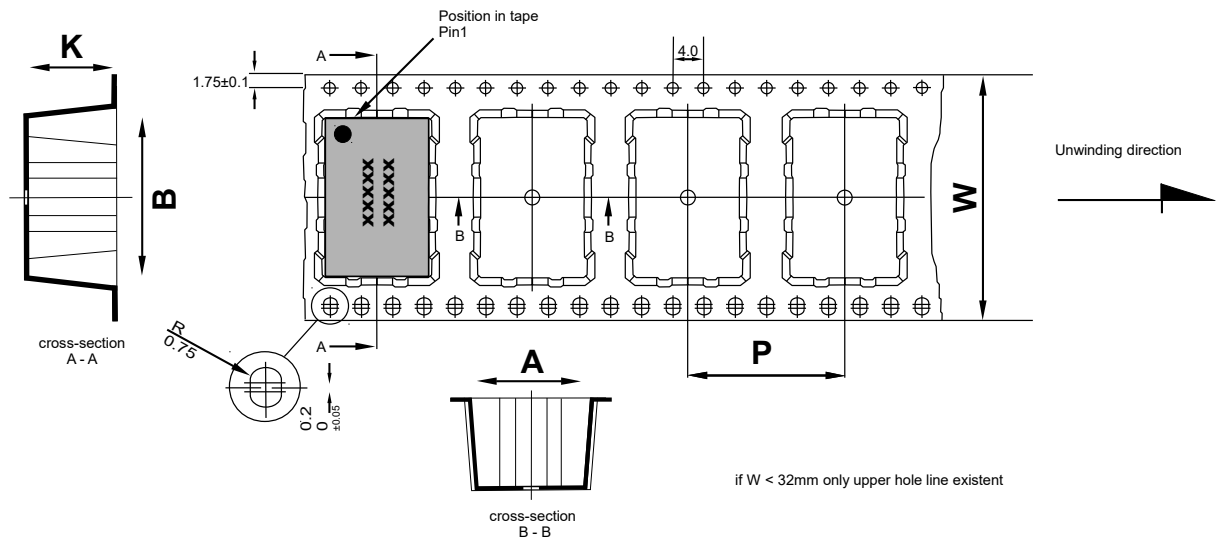
#### Marking

PS-701-xxxx
Frequency
•AYYWW

#### Enable true table (optional)

	LVPECL	
Pin 2	Pin 4	Pin 5
High	Data	Compl. Data
Open	Data	Compl. Data
Low	No Data	No Data

## Standard Shipping Method



Dimension in mm:

A, B and K are dependent upon component dimensions

production tolerance complying DIN IEC 286-3

All dimensions in millimeters unless otherwise stated

Enclosure Type	Tape Width W (mm)	Quantity per meter	Quantity per reel	Dimension P (mm)
G352 / G356	24		750	12

## Recommended Reflow Profile

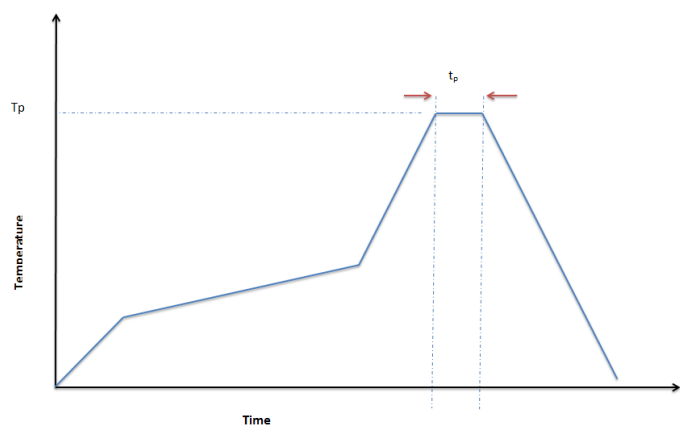
TP: max 250°C (@ solder joint, customer board level)

T<sub>p</sub>: max: 10...30 sec

Additional Information:

This SMD oscillator has been designed for pick and place reflow soldering

SMD oscillators must be on the top side of the PCB during the reflow process.



## Ordering Information

### PS - 701 0 - D E X - 254 X - 1000M0

Product Family

PS: SO

Package

5x7 mm SMT

Height

0: 2.5mm (G352: Sinewave)

1: 2.5mm (G356: LVPECL)

Supply Voltage

D: +5.0V

E: +3.3V

RF Output Code

C: LVPECL

E: Sinewave

Temperature Range

X: +10°C to +85°C

E: -40°C to +85°C

Frequency

Enable

X: No Enable (Sinewave)

1: Enable (LVPECL)

Stability Code

254: ±250ppm

#### Standard Frequencies (MHz)

632.8125	784.489605	832	867.1875	873.5154185	949.976022	980.604559
993.4096915	1000	1024.23965	1034.337568	1040	1067.686799	1200
1265.625	1280	1568.97921	1687.5	1701.32	1707.08	1734.375
1747.030837	1747.62305	1748.366885	1769.145	1875	1879.437686	1884.052863
1899.952044	1961.209118	1968.75	1986.819383	2000	2048.4793	2068.675135
2104.658326	2135.373597	2187.5	2400	2457.6	2560	2812.5
2949.12						

Other frequencies and temperature ranges available upon request

#### Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

## Contact Information

#### USA:

100 Watts Street  
Mt Holly Springs, PA 17065  
Tel: 1.717.486.3411  
Fax: 1.717.486.5920

#### Europe:

Landstrasse  
74924 Neckarbischofsheim  
Germany  
Tel: +49 (0) 7268.801.0  
Fax: +49 (0) 7268.801.281



Information contained in this publication regarding device applications and the like is provided only for your convenience and may be superseded by updates. It is your responsibility to ensure that your application meets with your specifications. MICROCHIP MAKES NO REPRESENTATION OR WARRANTIES OF ANY KIND WHETHER EXPRESS OR IMPLIED, WRITTEN OR ORAL, STATUTORY OR OTHERWISE, RELATED TO THE INFORMATION INCLUDING, BUT NOT LIMITED TO ITS CONDITION, QUALITY, PERFORMANCE, MERCHANTABILITY OR FITNESS FOR PURPOSE. Microchip disclaims all liability arising from this information and its use. Use of Microchip devices in life support and/or safety applications is entirely at the buyer's risk, and the buyer agrees to defend, indemnify and hold harmless Microchip from any and all damages, claims, suits, or expenses resulting from such use. No licenses are conveyed, implicitly, or otherwise, under any Microchip intellectual property rights unless otherwise stated.

#### Trademarks

The Microchip and Vectron names and logos are registered trademarks of Microchip Technology Incorporated in the U.S.A. and other countries.